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## Plane Truths about Movement-Frontal

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*Dave's post-secondary education began in Lincoln at the University of Nebraska, eventually leading him to attain his Bachelor of Science in Medicine and finally his Doctorate of Physical Therapy from the University of Nebraska Medical Center. He was first introduced to the science of Postural Restoration in the late 1990's as a patient at the Hruska Clinic which coincidentally was during the same time that he embarked on a new professional endeavor to become a physical therapist. Dave's experiences have provided him a unique and genuine understanding of what it means to be a patient. Dave is a member of the American Physical Therapy Association.*

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**I**t is essential that athletes are able to function in all three planes of movement: frontal, sagittal, and transverse. The goal of this article is to explain the importance of being able to perform frontal plane movements. An example of a frontal plane movement would be if you were standing with your weight shifted to the right and then you shifted your weight to the left. In order to do this seemingly simple movement, you must be able to abduct (away midline) your right leg, while simultaneously adducting (towards midline) the left leg. Consequently, if a person cannot properly adduct one leg, they will most likely be unable to effectively abduct the other leg. You can see examples of adduction with abduction with all animals in nature, whether you are watching a baby crawl, a cow walk, or even a salamander move forward, as they all move their upper body one direction, while simultaneously moving their lower body in the opposite direction.

So why as an athlete would you be concerned with any of this? Don't we perform these movements naturally? How could athletic performance be affected by limitations in any of these planes of movement? Although adduction and abduction as described above sound like simple movements, it is quite common to develop muscular imbalances that prevent a person from being able to perform them which ultimately can lead to decreased sports performance, not to mention the development of pain. The reason athletes should be concerned with these movements is because in reality, we are not as balanced as we may think. All people, whether right handed or left handed, are right side dominant creatures. For more information on how and why this is, refer to *Understanding Postural Symmetry to Improve Performance and Prevent Injury*, by Lori Thomson, P.T. in a recent

issue of this publication.

Right side dominance leads to the development of muscular imbalances throughout our bodies that affect our ability to function properly in the frontal plane without compensation. Muscles which move us through the frontal plane that are frequently affected are: left hip adductors, right hip abductors, and left abdominal obliques, just to name a few. Notice with each of the muscles listed, either the right or left side is affected, usually not both sides. It is because of these imbalances that athletes may suffer from any of the following: poor ability to shift their weight to the left compared to the right making it difficult to plant the left foot for a powerful kick with the right foot; athletic pubalgia due to asymmetrical pull of the right-vs-left hip adductors; decreased power coming from your hips and legs while batting in baseball/softball, especially for right handed batters; hip or shoulder impingement; poor positioning of the shoulder blades on the rib cage which will affect arm and shoulder mechanics decreasing power for throwing, hitting, and swinging movements from their arms. Activities such as running and cycling have a strong emphasis on the sagittal plane, leaving these athletes unbalanced if they don't include frontal plane activities, which may leave them with hip, back, or knee pain. Finally, most weight machines and even free weight equipment promote sagittal plane movements, leaving the frontal plane neglected.

Common indicators of a person who is limited or becoming limited in their ability to properly adduct/abduct are if the right shoulder is lower than the left, if the left lower ribs are more prominent than the right, a right calf that is larger than the left, or a right foot that is turned out when standing or walking.

So how can you decrease the likelihood of suffering these performance-affecting imbalances? One great exercise would be: Left Sidelying Left Flexed Adduction with Concomitant Right Extended Abduction (figure 1). This exercise promotes a combination of left hip adduction with right hip abduction. Another great exercise to promote improved side-bending through your trunk to the left (thoracic abduction) combined with left hip adduction would be the Sidelying Swiss Ball with passive Apical Expansion (figure 2).

**More Information Please!** To contact Dave or learn more about Postural Restoration by go to [www.posturalrestoration.com](http://www.posturalrestoration.com) or [www.hruskaclinic.com](http://www.hruskaclinic.com).



Figure 1

### Left Sidelying Left Flexed Adduction with Concomitant Right Extended Abduction

1. Lie on your left side with your right leg straight and your left leg bent at a 60-degree angle. Your right shoulder, hip, knee and ankle will be lined up.
2. Place 2-3 pillows under your head so that your head is slightly side bent to the right.
3. Place your left foot on a 2-3 inch bolster with your toes pressing into the wall and a small bolster underneath your left side.
4. Slightly raise your left knee off of the floor by turning your thigh "in" or by pushing your left heel into the wall and using it as a pivot point. You should feel your left inner thigh engage.
8. Keep your left knee raised from the floor and turn you right toes in.
9. Attempt to take your right foot off of the wall. You should feel your right outside hip engage.
10. Hold this position while you take 4-5 deep breaths in through the nose and out through the mouth.
11. Relax and repeat 4 more times.

### Sidelying Swiss Ball with Passive Apical Expansion

1. Place a swiss ball of appropriate size against a wall along with a 1-2 pound hand weight.
2. Position yourself on the ball lying on your left side. Your body will fall in the crevice between the ball and the wall. You should be far enough over the ball that your left forearm is touching the ground.
3. Place your right leg out in front of you and your left heel against the wall.
4. Reach over the top of your head with your right arm and grab onto the 1-2 pound hand weight with your right hand.
5. Maintaining the above position take a deep breath in through your nose filling up your right chest wall and exhale through your mouth as you try to let your right arm relax.
6. Slightly raise your left foot off the ground keeping your left toes turned in and your heel against the wall. You should feel your left inner thigh engage.
7. Take another deep breath in, you should feel a stretch throughout your right chest wall.
8. Exhale and let your right arm relax.
9. Raise your left leg slightly higher and take another breath in, exhale and let your right arm relax even more. If and when the right arm touches the floor, repeat above by moving your body in the direction of your feet so that your right hand remains slightly off the floor.
10. Continue this sequence until you have taken 4-5 deep breaths in through your nose and out through your mouth.
11. Relax and repeat 4 more times. O



Figure 2